

**THE INFLUENCE OF COGNITIVE  
DISSONANCE ON EMOTIONAL BEHAVIOR**

**BY**

**LENORE BALSAM BEHAR**









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A dissertation submitted in partial fulfillment of  
the requirements for the degree of Doctor of  
Philosophy in the Department of Psychology  
in the Graduate School of Arts and  
Sciences of Duke University

1962





ABSTRACT

(Psychology-Social)

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[ii]





# ABSTRACT

## THE INFLUENCE OF COGNITIVE DISSONANCE ON EMOTIONAL BEHAVIOR

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Observation of the precipitating situation offers one approach to the study of emotional behavior, for it appears that emotional responses are cognitively labeled in terms appropriate to the situation. Schachter (1959) suggests that the individual uses past experience to label his feelings; thus, emotions are identifiable only when the precipitating situation is clear-cut and familiar. He suggests that in ambiguously-defined situations pressures exist to establish the appropriateness of an emotional reaction, just as Festinger (1954) suggested that an individual establishes that his opinions are correct by realizing that others support the same opinions. Thus, adapting Festinger's social comparison theory to the study of emotional reactions, Schachter suggests that persons can only confidently evaluate their emotional reactions to ambiguously-defined situations by comparing their feelings with those of others in the same situation. To support this adaptation of social comparison theory, Schachter demonstrated that individuals in ambiguously-defined emotional situations prefer the company of others who experienced the same situation to that of individuals who were not exposed to that situation. Others also have demonstrated a relationship between emotional arousal in ambiguously-defined situations and the desire to affiliate.





One could apply the theory of cognitive dissonance to these studies, enabling generalization to situations which involve means other than affiliation for determining the appropriateness of an emotional response. It is assumed that when an emotional response occurs which the individual feels is inappropriate for the situation cognitive dissonance is aroused. Dissonance created in this way can be reduced by finding evidence in the environment which supports the reaction. This evidence can be gained by establishing that others respond the same way or by finding non-social stimuli that make the response seem appropriate.

This research was designed to demonstrate that in a fear-arousing situation, when the subject thinks his response deviates from the norm, he will choose to expose himself to fearful stimuli rather than to neutral stimuli in order to justify his reaction by finding stimuli to support it.

In order to arouse an emotion experimentally, subjects were threatened with electric shock. In addition, subjects received one of three types of information, i.e., that their fear in anticipating the shocks was lower than, higher than, or equal to the average reaction. The first two types of information were expected to induce dissonance which could be reduced by the first group's choosing to wait in a neutral situation; and the second group, in a fearful situation. It was thought that these choices would represent attempts to justify the reaction. The results indicate that there were attempts to justify the emotional reaction; the higher-than-average group did choose to expose themselves to the fearful stimuli and the lower-than-average group, the neutral stimuli. However, the neutral situation had greater attractiveness for all subjects; thus it is unclear whether the lower-than-average group's choosing the neutral stimuli was motivated by a need to reduce





dissonance or by the same attractions that caused the control groups to prefer the neutral situation.

In addition to supporting the application of dissonance theory to an ambiguously-defined emotional situation, the results indicate that ordinal position influenced the subject's reactions, as it did in the affiliation studies. It is apparent that the previously well-established effect of ordinal position on social affiliation may not be the result of social motivation.



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L. B. B.





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THE INFLUENCE OF COGNITIVE DISSONANCE ON EMOTIONAL BEHAVIOR



## Chapter I

### INTRODUCTION

Most investigators into the area of emotional behavior agree that emotional reaction is a psychophysiological phenomenon, that it is the coordination of mental experience and physiological change. Thus, one way to approach the study of emotional behavior is as a problem primarily of physiology; but attempts to understand emotional reactions by studying the accompanying physiological changes have been relatively unrewarding. Scientific studies have failed to demonstrate distinct differences between various emotional states when examined on the physiological level. In addition, Marston (1928) points out the uselessness of trying to find different types of motoric behavior for each emotion, for "affective states accompanying motor discharge give every evidence of being far more diverse than the ensuing sensations of resulting bodily changes could possibly be." Quite in contrast to the many specific physiological, physiognomic, and behavioral changes for each emotion listed by Aristotle, or Darwin, or Lange, to name only a few, experimental research suggests that the body reacts in much the same way for most all emotions and that physiognomic and behavioral manifestations, for the most part, are learned responses which may be highly individual (Dunbar, 1928; Fuckelick, 1936; Woodworth and Schlosberg, 1954). Even though there is very little evidence for distinguishing among various emotions from measures of changes in skin resistance, heart rate, pulse, respiration, or facial expression or pos-





ture, there are abundant labels to be applied to different emotional states (Warren, 1934). Woodworth and Marquis (1948) suggest that "emotions are distinguished, in practice, by stating the external situation in which each occurs and the type of overt response demanded. Any particular emotion is the stirred-up state appropriate to a certain situation and overt response." Dashiell (1928) in reviewing the work of Brunswick, Cannon, Karston, Burt and Larson, Watson and Morgan, Tolman and Sherman, explains that the contradictory and confusing nature of their interpretation of emotional reactions results partially from the fact that there is no clear evidence of a separate visceral reaction for each separate emotion and that the names of emotions refer to overt behavior patterns classified by social significance rather than by visceral components.

Since the stirred-up physiological state is similar for almost all emotions, it is rare for writers dealing with emotional behavior to discuss emotions without considering both physiological and situational factors. For example, Young (1943) defines emotion as "an acute disturbance or upset of the individual which is revealed in behavior and in conscious experience, as well as through widespread changes in the functioning of viscera, and which is initiated by factors within a psychological situation"; Ruckmick (1936) writes, "There is a tendency . . . to admit that pure bodily expression without the cognitive or 'intellectual' factor does not qualify as an equation for the expression of real emotion" and "we have learned that the feelings ultimately become involved with other mental processes, especially with the cognitive processes. What the child therefore feels depends more and more on what he cognizes or, in short, on the accumulations of his perceptual and ideational experiences."

Since many writers agree that physiological changes cannot explain emo-



tional behavior and that the individual's cognitive functioning appears to contribute so much, then investigation of the cognitive components of emotional reaction offers another approach to the problem. Schachter (1959) suggests that the cognitive factors determine the appropriateness of emotional behavior, that is, the response is cognitively labeled in terms appropriate to the precipitating situation. However, he points out that since the immediate situation is interpreted by past experience, forming a framework within which the individual can label his feelings, emotional states are identifiable only when the precipitating situation is clear-cut and recognizable. It is appropriate that an individual perched precariously on a rocky ledge to which he has just fallen should feel frightened; this situation clearly involves the possibility of death and therefore is one which would be universally frightening. In addition, there may be situations where the appropriate response is clearly defined for the individual, even though others may not react in the same way. For example, an individual may feel frightened when he sees a bearded man in a black suit because he associates such a figure with a punitive person in his past. However, there are many precipitating situations which are not so clear-cut; these situations involve ambiguous or unfamiliar stimuli, so that the individual is unsure of the appropriate emotional response. Schachter (1959) suggests that there are pressures to establish the "appropriateness" of an emotional reaction, just as Festinger (1954) has suggested that there are pressures to establish subjective feelings of correctness concerning opinions and behavior by comparison with others; these feelings stem from the realization that others support the same opinions and express the same behavior. Thus, adapting Festinger's theory of social comparison to the study of emotional reactions, Schachter suggests that persons





can only confidently evaluate the quality, intensity, and appropriateness of their emotional reactions to ambiguous situations by comparing their own feelings with those of others in the same situation. He postulates that the arousal of a strong emotion often evokes a need for comparison to establish a social reality, for "emotion-producing situations are often novel and outside the realm of our past experience."

To support this application of the theory of social comparison to the study of emotional behavior, Schachter (1959) has demonstrated that individuals in situations which evoke emotional reactions prefer the company of others who experience the same precipitating situation to that of individuals who are not exposed to the same situation. The situation to which Schachter's subjects were exposed, that of fear arousal, was indeed one where the appropriate behavior was not clearly defined; the subjects had no way of knowing whether the extent of their fear was appropriate. Schachter's explanation of the resulting tendency to affiliate is that by choosing to be with others who were exposed to the same situation, these subjects hoped to gain some information concerning the way others felt, i.e., the way it was appropriate to feel. Thus, Schachter's interpretation of his findings in terms of the theory of social comparison appears to be justified; and others (Gerard, 1962; Gerard and Rabbie, 1961; Radloff, 1961; and Sarnoff and Zimbardo, 1961) have demonstrated the relationship between emotional arousal and affiliation and have explained this relationship as based on the social comparison process.

However, it is also possible to apply the theory of cognitive dissonance (Festinger, 1957) to studies of this sort and thus provide an interpretation of emotional reactions that is applicable to more situations, includ-



ing those which involve means other than affiliation by which the individual can determine the appropriateness of an emotional response. A dissonance interpretation assumes that under certain conditions an emotionally-arousing stimulus situation can produce an inappropriate emotion; or it can, while evoking an appropriate emotion, produce a greater or lesser degree of feeling than is justified by the apparent objective characteristics of the event. Festinger (1957) has indicated that an emotional response such as fear can exist even though there are no objective stimuli in the environment to support the amount of fear experienced. For the individual who experiences such fear, dissonance is aroused by the discrepancy between his knowledge of his level of fear and his knowledge that there is no support for such a level of fear in the objective environment; in essence, he feels that his emotional reaction is out of proportion to the situation. An individual can reduce dissonance aroused in this way by acquiring cognitive elements which are consonant with the emotional reaction. He can alter the level of fear he experiences to make it consonant with the objective environment or he can alter the "objective" environment so that it supports the intensity of his emotional reaction. The former alteration appears to be the more difficult one, for the cognitive event is accompanied by involuntary responses of the autonomic nervous system, which by their very nature cannot easily be minimized or heightened. It appears easier to find support for the emotional response by altering the "objective" environment. For example, one could establish a social reality by finding that others faced with the same situation have reacted in the same way; or one could establish an altered "objective" reality by finding new stimuli that would be generally accepted as arousing the level of feeling in question.

It is suggested that the subjects in Schachter's experiments may have





experienced a discrepancy between the level of fear they felt and the amount of fear that seemed appropriate for the objective stimulus situation. The existence of two discrepant sets of cognitions, i.e., (1) I am very frightened; and (2) The experimenter says I will not be harmed so I should not be frightened, arouses dissonance and consequently a need to reduce dissonance either by altering the amount of fear experienced or by finding justification for that amount of fear. Since the experiment offered an opportunity for the latter solution, the subject could attempt to reduce dissonance by choosing to affiliate with others in the same stimulus situation hoping to find that the others experienced a level of fear similar to her own.

Research by Gerard and Rabbie (1961), derived from Schachter's work and designed to demonstrate that emotionally-arousing situations often create the need for social comparison, also offers evidence for the application of dissonance theory to the study of emotional behavior. They tested the hypothesis that when an individual is uncertain of the intensity of his emotional reaction he will seek information from others to provide himself with a frame of reference within which to evaluate his own reaction. The experimental conditions consisted of one group of subjects who were given information about the intensity of their own fear responses and of the responses of others in their group; a second group was given information about their own reactions but received no information about the other subjects; a third group was given no information about either their own or other group members' reactions. Because of the unclarity concerning the intensity of the fear reaction appropriate for the situation, subjects in the latter two conditions were expected to show greater affiliative tendencies than those in the first group; the results indicate that these expectations were met. However, even more interesting is that subjects who were given information only about their own reactions showed



greater affiliative tendencies than subjects who were given no information at all. This finding is clearly inconsistent with social comparison theory which suggests that clarification of one's reaction should arouse less need for comparison than the lack of such information should; thus clarification of one's own feelings, in this comparison, should also arouse less affiliative tendencies. However, if the affiliative tendency, in this case, were interpreted as an attempt for dissonance reduction rather than social comparison, then these results would be more in keeping with the theoretical expectations. According to dissonance theory, those subjects who received information about their own fear reaction had the cognition concerning their own fear strengthened and made more salient. Since the power of a cognition to arouse dissonance should increase as its clarity increases, a clear indication of one's own fear responses should be potentially capable of arousing more dissonance than would an ambiguous indication. Thus, subjects who are given information about the intensity of their own fear response should experience more dissonance, especially if the reaction is seen as inappropriate to the environmental cues, than should individuals who have no information aside from their subjective feelings. Gerard and Rabbie's subjects were asked to indicate, in retrospect, what they had expected their fear reactions to be. The absolute value of the discrepancy between this indication and the actual value reported to the subject was correlated with the subject's desire to affiliate (evaluated by the subject on a 100 point scale). Only subjects in the group which had received information just about their own reactions demonstrated a high positive relationship ( $+ .72$ ) between these two measures. This finding suggests that it is concern about the appropriateness of the intensity of his fear reaction that motivates the subject to seek affiliation; he appears to be seeking social support for one of the two inconsistent sets





of cognitions. Although Gerard and Rabbie offer a similar interpretation, they have ignored the possibility of applying dissonance theory to their study and instead offer a rather tenuous interpretation based on social comparison theory.

In a similar study generated by Schachter's research, Radloff (1961) demonstrated that a person who is uncertain about the correctness of one of his opinions, for which there are no objective criteria available by which to evaluate its correctness, will seek affiliation with others. Although Radloff applied the theory of social comparison to his findings, he also suggests that an interpretation based on dissonance theory might be appropriate. He discusses the generation of cognitive dissonance as a probable consequence of stating an opinion, that is, of committing oneself to a position on a complicated, multi-sided issue. In such an instance, "first the person may be aware that he could have taken a position other than the one he has assumed; second, he may feel that other people will not agree with his stand." Radloff offers a study by Festinger, Riecken, and Schachter (1956) as evidence that dissonance arising from these sources can produce affiliative behavior.

The application of dissonance theory to the study of emotional behavior has been suggested by the research of Schachter (1959), Gerard and Rabbie (1961), and Radloff (1961), but a clearer demonstration of the relationship is necessary to show unequivocally that it is appropriate to interpret emotional reactions precipitated by similar situations in terms of dissonance theory. In the experiments discussed above, it was suggested that subjects attempted to find support for their emotional reactions by establishing that others had the same reactions. Another approach to the problem would be for the individual to seek evidence in the environment, other than by com-





paring himself with others, that would support the appropriateness of his reaction. Festinger (1957) discusses an informal experiment done by Murray (1933) in which the subjects altered the environment so that it provided a cognition consonant with being frightened. Murray asked a group of eleven-year-old girls to rate photographs of people in terms of how benign or how malicious the person appeared; he asked them to repeat this rating after a pleasant experience and again after a frightening one. There was a strong tendency for the girls to see the people in the photographs as more malicious after being frightened; Murray describes his finding as follows: "It was as if the subjects, experiencing an emotion without adequate stimulus, sought something in the external world to justify it." Festinger discusses two additional studies (Prasad, 1950; Sinha, 1952) which demonstrate that individuals seek stimuli in the external environment to justify a strong emotional reaction which seems out of proportion to the situation. Following an earthquake in India, Prasad found that rumors predicting terrible disasters to come were prevalent in an area where people felt the shock of the quake but experienced no destruction. One might assume that a strong reaction of fear was generated by the threat of an earthquake. The fact that the actual quake did not occur in the area left a large number of people with identical dissonance, that is, a state of cognitive conflict between the fear they felt and the realization that there was nothing to be afraid of, for there was no evidence of damage in the environment. Thus, the rumors predicting future disasters, which were widely circulated, provided cognitions which were consonant with feeling frightened. Festinger suggests that the rumors might appropriately be called "fear-justifying" rumors, for they offered justification for feeling frightened even though the fear was originally generated by another event; such justification would be dissonance reducing. A shortcoming of this appli-



cation of dissonance theory is that Prasad presents no information concerning the type of rumors circulated by people in the area where destruction by the earthquake did exist. However, following another disaster in India, Sinha (1952) collected rumors which were circulated within the area of destruction. This disaster, a landslide, was fully comparable to the earthquake in terms of destruction and loss of life; and most likely, the landslide generated as much fear as the earthquake within the areas where the most damage occurred. But within the area of destruction Sinha found little evidence of seriously exaggerated rumors or rumors predicting future disasters. According to a dissonance interpretation, such findings might mean that people within the area of destruction had no need to create "fear-justifying" rumors for evidence in the environment produced sufficient cognitions that were consonant with the feeling of fear.

#### Statement of the Specific Problem

In an attempt to understand emotional reactions through the application of cognitive theories, two general approaches to the problem were discussed above. One group of studies suggests that in situations of emotional arousal, when individuals are uncertain as to the appropriateness of their emotional response, they attempt to find evidence to justify their emotional reactions by choosing to affiliate with others who have had the same experience and thus obtain social support for their feelings. Although the results of these experiments were originally interpreted in terms of social comparison theory, the application of dissonance theory seems more appropriate. Another group of observations suggests that individuals in the same sort of predicament, that is, uncertainty concerning the appropriateness of their emotional reactions,





might attempt to find evidence to support their reactions by seeking additional emotion-justifying stimuli in the environment. If such stimuli are not to be found, it is likely that such individuals would fabricate evidence in the environment to justify their emotional reactions. An interpretation of these findings based on dissonance theory is clearly appropriate. Thus, by combining these two types of situations, one could more clearly demonstrate that in emotionally arousing situations, where the appropriate intensity of reaction is ambiguously defined, the individual experiences a state of cognitive dissonance and that subsequent behaviors are attempts to reduce dissonance. Given the opportunity, he may choose to affiliate with others in the same situation for the purpose of finding support for one set of cognitions; however, if this opportunity is not made available and instead, the individual is given the choice of exposing himself to emotion-justifying stimuli or to neutral stimuli, and he demonstrates a preference for the emotion-justifying stimuli, then one could clearly explain the individual's behavior as motivated by a desire to reduce dissonance. In this case, the possibility of explaining behavior in an ambiguously-defined, emotional situation as motivated by the desire for social comparison would be eliminated. Thus, to demonstrate the appropriateness of dissonance theory rather than social comparison theory in such situations, the following hypothesis is proposed: Under conditions of emotional arousal, an individual who receives information which implies that the intensity of his reaction is out of proportion to the stimulus situation, in order to reduce dissonance, will choose to expose himself to stimuli which would justify his emotional response; an individual who does not receive information which implies an inappropriate emotional response will show no such desire. These predictions involve emotional reactions which are less intense than appears to be appropriate, as well as reactions which are more intense than the situation warrants.





## Chapter II

### METHOD

This experiment, designed to study the effects of cognitive dissonance on emotional reactions, was conducted under the guise of a study of sensitivity to electric shock. Two levels of threat, Moderate Threat and High Threat, were induced by telling the subjects in one condition that they would receive a short series of increasingly stronger shocks which would be stopped if they became painful; subjects in the second group were told that they would receive a long series of increasingly stronger shocks which would not be stopped and which were expected to be painful. The subject was led to believe that his level of fear while anticipating the experiment could be measured by means of electrodes attached to a cuff placed on his arm.

Within the Moderate Threat condition, three information treatments were administered in an attempt to create varying degrees and types of cognitive dissonance. In one treatment, the subject received information that his fear reaction was much lower than average; in a second treatment, the subject received information that his fear reaction was much higher than average. It was expected that either type of information would provide a set of cognitions that would be dissonant with the cognition of giving the average reaction, i.e., the "appropriate" reaction. As a control measure, in the third treatment the subject was informed that his reaction was just about average.

In the High Threat condition, one information treatment was administered; the subject in this group was informed that his reaction was just about



average. This condition was introduced to eliminate the possibility of interpreting effects which might occur in the High Fear treatment as resulting from a high level of fear aroused in the subject by reporting to him a level of fear which might appear toward the high extreme of the meter; thus, these effects could more confidently be interpreted as resulting from the dissonance created by informing the subject that his reaction was inappropriate.

After the subject had been threatened with shock and his level of fear reported to him, the experimenter explained that her assistant, who was to conduct the remainder of the experiment, had been called away on an emergency; as a measure of dissonance reduction, the subject was asked whether he preferred to wait in the experimental laboratory (a fear-arousing situation) or in a waiting room (a neutral situation). Other data were then obtained by means of a questionnaire.

### Subjects

The subjects in this experiment were sixty male and sixty female undergraduates recruited from introductory psychology classes at Duke University. The experiment was conducted first with the sixty female subjects; then it was replicated with the sixty male subjects. The subjects were run through the experiment individually by a female experimenter.

### Experimental Setting

Upon arriving at the experimenter's office to participate in what had been described as a sensitivity study on the recruitment sheet, the subject was greeted by the experimenter who was wearing a white laboratory coat; he was





asked to sit at a small table facing the experimenter. A black wooden shield, 10-1/2" high, extended the length of the table between the subject and the experimenter. Directly in front of the shield, on the table, was a meter with a 4-1/2" x 2-1/4" face and with a dial ranging from zero to 250. Attached to the sides of the meter were four wires. Two brown wires appeared to lead to a wall socket behind a bookcase located to the subject's left; wires from a control box behind the shield appeared to be connected to the wires from the meter. Two wires, colored orange and yellow, led from the meter to a plastic cuff which was lined with foam rubber. The cuff was lying on the table, in front of the subject.

The experimenter gave the subject the following information:

This experiment is designed to test your sensitivity to electric shock. The actual experiment will not take place in this room, but perhaps you noticed as you came here that there are several rooms on this corridor--one of these is the experimental laboratory to which I'll take you in a few minutes. I have an assistant whose name is Mr. Butler and he will conduct the rest of the experiment with you. But first, because of the nature of the experiment, I felt that I wanted to talk to each subject--to explain just what would be happening to you and to get certain information about you.

At this point, the subject was asked to fill out a "routine information sheet" (see Appendix A) which asked for the subject's name, address, age, parents' names and address, name and address of a person in the vicinity to notify in case of emergency, and names, ages, and sexes of siblings. At the bottom of this form was a list of chronic medical ailments, and the subject was asked to check those which he had or had once had. In addition to the printed questions, the subject was asked to indicate somewhere on the sheet what his major was, if he had decided upon one.





## Experimental Manipulations

Manipulation of threat. After the preliminary information had been collected, the subject was given one of two descriptions of the anticipated experiment; one description was designed to moderately threaten the subject, and one was designed to greatly threaten the subject.

Moderate Threat. Subjects in the Moderate Threat condition (ninety subjects) were told the following:

The experimental assistant, Mr. Butler, will give you a series of electric shocks, a maximum of ten. He'll begin with a very mild shock and each one will be increasingly stronger than the last. One of the purposes of the experiment is to see how people define pain in terms of this series of shocks. What we want you to do is to indicate when you feel the shocks are becoming painful and this is where the experiment will stop. Of course, you will not be given the remaining shocks.

It was pointed out to the subject that he could actually avoid any great pain by anticipating the painful shock and asking to stop the experiment.

High Threat. Subjects in the High Threat condition (thirty subjects) were told that they would receive a series of twenty-five electric shocks, beginning with a very mild shock with each one increasingly stronger than the last. Subjects in this condition were asked to indicate when the shocks became painful in order to fulfill one of the purposes of the experiment, i.e., "to see how people define pain in terms of this series of electric shocks."

They were informed of a second purpose of the experiment as follows:

To demonstrate that psychological pain--the feeling that something hurts--is different from physiological pain, which is defined as a muscle contraction or spasm. In order to demonstrate this difference between psychological pain and physiological pain, which in most cases occurs after the experiencing of psychological pain, it will be necessary to continue shocking you after you feel pain until we can record a muscle contraction. In most cases the contraction occurs about shock number twenty-five, but in any case we will stop at this point. Most people feel that the shocks become painful somewhere between shocks number twelve and sixteen.

The subject was reassured that although the experiment would be quite painful,



there would be no aftereffects in terms of burns, headache, or sore muscles and that certainly there would be no permanent damage to him. Apologies were made for asking the subject to participate in such a painful experiment and justification for the procedure was offered in terms of the scientifically valuable information that could be obtained.

Subjects in both threat conditions were then told that the experimenter was also interested in studying emotional reactions to being shocked because "how frightened an individual is of being shocked has a great effect on how he will react to the shocks." Permission was asked to measure the subject's level of fear while anticipating the experimental procedure so that it might be compared with measures taken during the experiment. The experimenter called the subject's attention to the cuff and explained that it would be placed on his wrist to obtain the desired measures. Prior to placing the cuff on the subject, the experimenter wiped off the subject's wrist with cotton dipped in water and she briefly explained the principle of the galvanic skin response. She also directed the subject's attention to the meter that was to record his fear reaction.

Dissonance arousal. All subjects (ninety) in the Moderate Threat condition were informed that the average response of other subjects in the experiment was 75, as recorded on the meter. As a check on the subject's perception of his own fear in relation to the reported norm, each subject was then asked to guess what his reaction would be. At this point, the meter was turned on and subjects were provided with one of three types of information.

Low Fear. Each of the thirty subjects in this treatment received information that there was a discrepancy in a lower-than-average direction between his own level of fear and that of others who had participated in the experiment;





in this treatment, the meter registered 25 for each subject.

High Fear. Each of the thirty subjects in this treatment was informed of a discrepancy in a higher-than-average direction; for these subjects, the meter registered 150.

Average Fear. Each of the thirty subjects in this treatment received information implying no discrepancy between his level of fear and the reported average; the meter registered about 75.

In all three information treatments, the subjects were asked to confirm the experimenter's reading by checking the meter and repeating the reading; the deviation or lack of deviation from the average was emphasized. However, no explanations were offered as to why such readings might occur.

In the High Threat condition, one information treatment was administered. Each of the thirty subjects in this condition was informed that the average meter reading for other subjects was 150. As in the other conditions, the subject was asked to guess what his reaction would be; then, his reaction was reported to be about 150. The subject was asked to confirm the reading by checking the meter; and the lack of deviation from the average was emphasized. Because there was only one information treatment, the Average Fear treatment, administered in the High Threat condition, this treatment will be referred to as the High Threat condition to differentiate it from the Average Fear treatment in the Moderate Threat condition.

#### Measuring Dissonance Reduction

After receiving information concerning his own level of fear, each subject was told that the experimental assistant, who was to conduct the re-





mainder of the experiment, had been called away on an emergency and was expected to return within ten or fifteen minutes. The experimenter asked the subject if he were willing to wait for the assistant and continue with the experiment; if so, he was given the following choice:

You actually can wait for Mr. Butler in one of two places. You can wait in the experimental laboratory where you will be shocked later or you can wait in the room next to it which is something like a waiting room. Of course, there is a place to sit in both rooms and there are some magazines in the waiting room.

After the subject had verbally indicated his preference, he was asked to fill out a second questionnaire (see Appendix B) with the following explanation:

This questionnaire has been designed to get at certain physiological measures which might influence your reaction to shock--such as how hungry or tired you are--or if you are not feeling well. There is also a question which is like a personality measure to get at your attitudes toward the experiment, for this might influence your reaction.

Actually, items concerning the subject's physiological state were used only to make the introduction of the questionnaire seem appropriate at this point in the experiment. The remaining items served as a check on the threat manipulation and as another measure of dissonance reduction.

A question concerning the amount of discomfort the subject expected to feel during the remaining part of the experiment was designed to measure the effects of the two levels of threat. It was expected that subjects in the High Threat condition would anticipate greater discomfort than subjects in the Moderate Threat condition, as measured by this 100-point scale.

A series of scales asked for the subject's description of what he imagined the experimental assistant, Mr. Butler, to be like; these scales were to serve as a more subjective measure of dissonance reduction, similar to the technique of rating photographs of people used by Murray (1933). The subject



in the High Fear treatment was expected to imagine the assistant as more negative than subjects in other conditions were expected to imagine him; and the subject in the Low Fear treatment was expected to view him as more positive. It was expected that the subject would use such ratings of the assistant as a way of justifying the level of fear he was told he was experiencing.

A question concerning the subject's rating of the scientific value of the experiment was included as a way of determining how important the experiment was to the subject or how involved he was in the experiment. It was expected that the manipulations would be more effective for subjects who rated the experiment high on the 100-point scale.

When the subject had completed the questionnaire, to determine whether or not he believed that he would be shocked, he was asked if he had any questions about what would be happening to him. The experimenter then revealed the deception and described, in brief, the purpose of the experiment. The subject was asked not to discuss the experiment with anyone else. The entire procedure generally took about one-half hour.

Table 1 summarizes the experimental design. The cells contain the number of subjects in each group and the meter reading provided to the subject. It may be seen that the study contains two control groups. The Average Fear group in the Moderate Threat condition was designed to serve as the basis of comparison for each of the other two fear groups. In the High Threat condition, all subjects were exposed to a manipulation similar to the Average Fear manipulation in the Moderate Threat condition; thus any effects obtained in the High Fear treatment and not in the High Threat condition could more confidently be considered the result of dissonance created by the introduction of a discrepancy between the reported average reaction and the reaction reported as the subject's own rather than the result of a high level of fear aroused in





the subject by the high meter reading.

Table 1

Level of Fear Reported to the Subject

	Low Fear	Average Fear	High Fear
Moderate Threat	25	75	150
(average = 75)*	(N=30)	(N=30)	(N=30)
High Threat		150	
(average = 150)*		(N=30)	

\*These scores were reported to the subject as the average scores of other people in the experiment.

Note: In all cells, both sexes were equally represented.



### Chapter III

#### RESULTS

##### Effectiveness of the Experimental Manipulations

Threat manipulation. In using the subjects' estimates of the amount of discomfort they expected to feel in the experiment, it was assumed that the subjects in the High Threat condition would tend to anticipate more discomfort than the subjects in the Moderate Threat condition. It was explicitly stated in the instructions to the subjects in the High Threat condition that the experiment would be painful, whereas subjects in the Moderate Threat condition were informed that they could avoid pain by signaling to stop the experiment. Table 2, which presents the mean scores of the question concerning anticipated discomfort for all the experimental treatments, offers evidence that female subjects in the High Threat condition anticipated significantly more pain than female subjects in any of the Moderate Threat conditions. Thus the threat manipulations can be considered effective for females. However, as can be seen in Table 2, the amount of discomfort anticipated by male subjects in the High Threat condition, while in the expected direction, does not differ significantly from that of males in the Moderate Threat condition. It is not clear that the lack of a significant difference in the amount of discomfort anticipated by male subjects in the two threat conditions should be interpreted as an indication that the threat manipulation was ineffective. Another pos-



Table 2

Amount of Discomfort Anticipated by Moderate Threat  
and High Threat Groups

	Moderate Threat				High Threat
	Low Fear	Average Fear	High Fear	3 Groups Combined	
<b>Males</b>					
Mean	46.60	45.13	47.13	46.29 <sup>a</sup>	52.87 <sup>a</sup>
S.D.	13.91	16.89	23.59	18.17	20.81
N	15	15	15	45	15
<b>Females</b>					
Mean	48.13	49.67	51.47	49.76 <sup>b</sup>	70.00 <sup>b</sup>
S.D.	18.29	13.57	17.91	16.15	13.57
N	15	15	15	45	15
<b>Males and Females</b>					
Mean	47.37	47.40	49.30	48.02 <sup>c</sup>	61.43 <sup>c</sup>
S.D.	15.99	15.24	20.41	17.18	19.33
N	30	30	30	90	30

Comparisons of means by two-tailed t tests:

a.  $t = 1.171$ ;  $p > .10$

b.  $t = 4.361$ ;  $p < .001$

c.  $t = 3.587$ ;  $p < .005$

Note: This item was scored on a 100 point scale with a score of 100 representing the greatest amount of discomfort.

sible interpretation of such findings is that there was a defensive effect on this scale for males, i.e., the male subjects in the High Threat condition were unwilling to admit, especially to a female experimenter, that they actually did anticipate a great amount of discomfort. The latter interpretation appears to be a reasonable one for, as will be seen in the discussion of other measures, males and females performed quite similarly; this suggests that the threat manipulation was as effective for males as for females, even though the males did not admit to as much anticipated discomfort.

Although both Schachter (1959) and Gerard and Rabbie (1961) used the





increased number of subjects in their high threat conditions who refused to continue the experiment as a measure of the effectiveness of the threat manipulation, such a measure is inappropriate in this study. Instructions to the subject in the High Threat condition included the statement, "One reason that I feel encouraged about asking people to participate in such a painful experiment is that so far no one has refused to take part in it." Although each subject was asked if he wished to continue with the experiment, this question was introduced as a form of commitment to the situation and it was not expected that anyone would refuse to continue.

Just prior to revealing the true nature of the experiment to the subject, the experimenter asked him if he had any questions about what would be happening to him in the experimental situation. Subjects in all conditions asked questions which indicated that they believed that they would be shocked. Many of the questions concerned the voltage to be used, the place where the electrodes would be attached, or the way that others had reacted to the shocks. In a post-experimental interview, the subject was directly asked if he had believed that he would be shocked. The majority of the subjects believed the instructions; a few felt some doubt, but they did not feel certain that they would not be shocked. Data from three subjects had to be eliminated from all analyses because they clearly suspected that they would not be shocked, even though these data do not appear to be different from the data of non-suspecting subjects.

Information manipulation. The subject's guess as to the level of his own fear reaction, made after he had been informed of the average reaction of the other subjects, can be used as an indication of whether or not the subject perceived his own fear to be similar to most other subjects in the experiment and also as an indication of the amount of deviation from the norm that the



subject considered to be within normal limits. There were no significant differences between experimental groups concerning the average deviation of the subjects' guesses from the given mean; that is, subjects in all the Moderate Threat groups tended to estimate their fear reactions to be near 75, the given average; and subjects in the High Threat condition tended to estimate their reactions to be near 150. Of the ninety subjects in the Moderate Threat condition, thirty-five (39%) guessed their reactions to be exactly 75; of the thirty subjects in the High Threat condition, fifteen (50%) estimated their reactions to be exactly 150. Of the ninety subjects in the Moderate Threat condition, seventy-four (82%) guessed their reactions to be within twenty-five points of the mean of 75, either above or below it; of the thirty subjects in the High Threat condition, twenty-five (83%) estimated their reactions to be within twenty-five points of the mean of 150, either above or below it. Males and females did not differ in their responses in any of the experimental groups. Thus it appears that most of the subjects perceived their own level of fear to be quite similar to the average. Neither the amount nor the direction of deviation was related to sex, experimental group, room choice, or birth order (see Appendix C).

Since 90% (109 of the total 120 subjects) estimated their own fear reaction to be within twenty-five points of the given average, the score reported to the subjects as their own level of fear, 25 in the Low Fear treatment and 150 in the High Fear treatment, would seem to be a psychologically meaningful deviation, sufficient to create dissonance. The somewhat greater, but not significant, deviations estimated by the subject in the Low Fear treatment would serve to strengthen the effects of the dissonance-producing information, for most of the subjects in the Moderate Threat condition guessed their fear reactions to be above average and the level of fear reported to them as their own was fifty points below average.





During the post-experimental interview, a majority of the subjects indicated that they had accepted the meter reading as a true measure of their level of fear. A few subjects in the High Fear treatment reported that they found it hard to believe that their reactions could be so deviant, but nonetheless they accepted the meter reading as accurate. Data from one subject who clearly suspected that the meter was rigged were not used.

Importance of the experiment to the subject. The questionnaire item concerning the scientific value of the experiment was used as a measure of how important the experiment was to the subject. The expectation was that subjects who evaluated the experiment highly would be more affected by the experimental manipulations, for one could assume that they were more involved in the experiment. Mean responses to this question are presented in Table 3 by experimental treatment groups. It is evident from the data presented in Table 3 that the mean responses do not differ significantly from group to group, with the exception that male subjects in the Low Fear treatment evaluated the experiment significantly higher than males in the Average Fear treatment ( $t = 2.901$ ;  $p < .01$ ). There does not seem to be a theoretically-based explanation for the difference found between males in the Low Fear treatment and the Average Fear treatment. Most likely, this is a chance finding since no other systematic differences appear to accompany or to result from this difference. The mean evaluation given by each group seems to be high enough to suggest that the experiment was fairly important to most subjects.

To summarize the effectiveness of the experimental manipulations, the following findings are relevant: (1) For females, significant differences between High Threat and Moderate Threat conditions in the subjects' rating of anticipated discomfort indicate the effectiveness of the fear manipulation. There is a similar, though unreliable, trend for males. (2) In all treatments



Table 3

## Evaluation of the Experiment by Treatment Groups

	Moderate Threat			High Threat
	Low Fear	Average Fear	High Fear	
<b>Males</b>				
Mean	77.53 <sup>a</sup>	62.20 <sup>a</sup>	67.40	65.28
S.D.	12.91	15.88	21.14	22.80
N	15	15	15	15
<b>Females</b>				
Mean	70.33	68.87	68.27	70.60
S.D.	33.52	20.57	21.69	14.51
N	15	15	15	15
<b>Males and Females</b>				
Mean	73.93	65.53	67.83	67.93
S.D.	25.24	18.37	21.05	18.99
N	30	30	30	30

a. A comparison of means yields a  $t = 2.901$ ;  $p < .01$  (two-tailed  $t$  test).

Note: This item was scored on a 100 point scale with a score of 100 representing the most favorable evaluation.

the subjects tended to guess their own level of fear to be similar to what they were informed was the average level of fear; thus, the information manipulation appears to have been effective in communicating a norm to the subject. The majority (90%) of the subjects guessed their level of fear to be within twenty-five points of the given norm. This finding suggests that reporting to the subject that his score differed from the norm by fifty points or more would provide a psychologically meaningful deviation for him. An informal, post-experimental interview revealed that most of the subjects believed the instructions and did not suspect a deception. Data from those subjects who suspected that they would not be shocked or that the meter was rigged were not used. (3) Relatively high scores in all groups concerning the evalua-





tion of the experiment suggests that most subjects were involved in the experiment.

### Evidence of Dissonance Reduction

Room choice. The hypothesis tested by this study implies that subjects who experience dissonance as the result of a discrepancy between the level of fear they consider to be normal for the situation and the level of fear they believe themselves to be experiencing will attempt to reduce dissonance by seeking information which will support the experiencing of a level of fear discrepant from the normal. In the experimental situation, the subject's choice to wait in the experimental room or the waiting room represents his choice of the type of information to which he wishes to expose himself. According to the theoretical basis of this experiment, choosing the experimental room represents seeking to place oneself in the fearful situation in order to justify a high level of fear; and choosing the waiting room represents the lack of a need for such justification. The results relevant to this hypothesis are presented in Table 4 in terms of the number of subjects choosing each room in each experimental treatment. It is evident that there is a strong tendency for subjects in all conditions to choose the waiting room over the experimental room; however, subjects in the High Fear treatment did show a greater preference for the experimental room than other subjects did. (Since the responses of males and females were strikingly similar, their data were combined for the analyses discussed below.) There is a significantly greater tendency for subjects in the High Fear treatment to choose the experimental room as compared with subjects in the High Threat condition (chi square = 5.959;  $p < .02$ ). This finding suggests that subjects were motivated to choose





Table 4

Number of Subjects in Each Treatment Choosing  
the Experimental Room or Waiting Room

		Moderate Threat			High Threat
		Low Fear	Average Fear	High Fear	
Experimental Room	Males	4	3	6	2
	Females	2	3	5	1
Waiting Room	Males	11	12	9	13
	Females	13	12	10	14

Comparisons across conditions:

- (1) High Fear vs. High Threat: chi square = 5.959;  $p < .02$ .
- (2) High Fear vs. Average Fear: chi square = 2.049;  $.10 < p < .20$ .
- (3) High Fear vs. High Threat and Average Fear combined: chi square = 5.431;  $p < .02$ .

the experimental room, i.e., the fear-justifying situation, as a means of reducing dissonance rather than as an attempt to prove that they were not as frightened as the meter indicated. The comparison between the High Fear and Average Fear Treatments offers somewhat weaker evidence that a greater proportion of subjects in the High Fear treatment show a preference for the experimental room (chi square = 2.049;  $.10 < p < .20$ ). When a comparison is made between subjects in the High Fear treatment and subjects in the Average Fear and High Threat groups combined, there is evidence that a greater proportion of subjects in the High Fear treatment chose the experimental room (chi square = 5.431;  $p < .02$ ). It is theoretically justifiable to compare High Fear subjects with subjects in both the Average Fear treatment and the High Threat con-



dition for both of these groups were designed to serve as control groups and behaviorally the difference between the responses of these two groups of subjects is not significant.

Within-condition evidence on the determinants of dissonance. Further evidence of dissonance reduction is found in the responses to the questionnaire which reveal significant differences between subjects who choose the waiting room and those who choose the experimental room. These differences occur only in the High Fear treatment.

Anticipated discomfort and room choice. Questioning the subject concerning the amount of discomfort he anticipates while being shocked was originally meant to determine the effectiveness of the threat manipulations; and as reported above, the mean responses within the two threat conditions indicate that the manipulations were effective for females and that the effectiveness for males is open to question (see Table 2). However, further inspection of the responses to this question reveals significant differences within the High Fear treatment when subjects are divided on the basis of room choice. Table 5 presents the mean amount of discomfort anticipated by subjects in each experimental treatment. Only in the High Fear treatment do subjects choosing the experimental room and subjects choosing the waiting room differ significantly in the amount of discomfort anticipated ( $t = 2.387$ ;  $p < .05$ ).

Another way of viewing the same data is to dichotomize the subjects within each experimental treatment at the median according to the amount of discomfort anticipated and to divide them according to room choice, forming the frequency table presented as Table 6. Data for both sexes were combined, since the responses for males and females were strikingly similar. Within the High Fear treatment, a comparison of the room chosen by subjects above the





Table 5  
Room Choice and Amount of Discomfort Anticipated  
Comparison of Mean Discomfort Scores

		Moderate Threat			High Threat
		Low Fear	Average Fear	High Fear	
<b>Males</b>					
Experimental Room	Mean	49.50	54.33	36.17 <sup>a</sup>	43.50
	S.D.	20.92	14.01	30.17	30.40
	N	4	3	6	2
Waiting Room	Mean	45.54	42.83	54.44 <sup>a</sup>	54.31
	S.D.	11.63	17.28	16.04	20.26
	N	11	12	9	13
<b>Females</b>					
Experimental Room	Mean	47.00	43.33	41.20 <sup>b</sup>	67.00
	S.D.	7.07	11.93	20.82	0
	N	2	3	5	1
Waiting Room	Mean	48.15	51.25	56.60 <sup>b</sup>	70.21
	S.D.	19.64	13.96	13.38	14.05
	N	13	12	10	14
<b>Males and Females</b>					
Experimental Room	Mean	48.67	48.83	38.46 <sup>c</sup>	51.33
	S.D.	16.56	13.10	25.18	25.42
	N	6	6	11	3



Table 5 (continued)

		Moderate Threat			High Threat
		Low Fear	Average Fear	High Fear	
Waiting Room	Mean	47.04	47.04	55.58 <sup>c</sup>	62.56
	S.D.	16.19	15.94	14.32	18.81
	N	24	24	19	27

Comparisons of means by two-tailed  $t$  tests:

- a.  $t = 1.539$ ;  $.10 < p < .20$
- b.  $t < 1.0$ ;  $p$  is not significant
- c.  $t = 2.387$ ;  $p < .05$

Note: This item was scored on a 100 point scale with a score of 100 representing the greatest amount of discomfort.



Table 6

## Room Choice and Amount of Discomfort Anticipated

Number of Subjects Choosing the Experimental  
Room and the Waiting Room

		Moderate Threat			High Threat
		Low Fear	Average Fear	High Fear	
<hr/>					
Much Discomfort <sup>a</sup>					
Experimental Room					
	Males	2	2	2	1
	Females	1	1	1	0
Waiting Room					
	Males	6	6	7	7
	Females	7	7	6	8
<hr/>					
Little Discomfort <sup>b</sup>					
Experimental Room					
	Males	2	1	4	1
	Females	1	2	4	1
Waiting Room					
	Males	5	6	2	6
	Females	6	5	4	6
<hr/>					

Comparison within High Fear treatment by Fisher exact probability test:

1. Much Discomfort vs. Little Discomfort and Experimental Room vs. Waiting Room;  $p = .035$ .

Comparisons across treatments within Little Discomfort group by Fisher exact probability tests:

1. High Fear vs. High Threat and Experimental Room vs. Waiting Room;  $p = .023$ .
2. High Fear vs. Low Fear and Experimental Room vs. Waiting Room;  $p = .060$ .





Table 6 (continued)

3. High Fear vs. Average Fear and Experimental Room vs. Waiting Room;  
 $p = .060$ .
  4. High Fear vs. Average Fear and High Threat combined and Experimental  
Room vs. Waiting Room;  $p = .038$ .
- a. Above the median.
  - b. Below the median.



median with that chosen by subjects below the median indicates that anticipation of little discomfort is significantly related to choosing the experimental room ( $p = .035^*$ ). This relationship does not appear in the other treatment groups. Just dealing with those subjects who scored below the median, that is, who anticipated little discomfort, comparisons of subjects in the High Fear treatment with each of the other treatments indicate that a significantly greater proportion of subjects in the High Fear group chose the experimental room. The comparison with the High Threat group yields a probability of .023;\* the comparisons with the Average Fear and Low Fear groups, for which the data were identical, yield a probability of .060.\* When the data from those subjects scoring below the median in the Average Fear and High Threat groups are combined, a comparison with the High Fear group yields a probability of .038.\* All of these analyses support the findings reported in Table 5, that for subjects in the High Fear treatment, anticipation of little discomfort is significantly related to the choice of the experimental room; and that a relationship of anticipated discomfort and room choice does not occur in any other treatment group either among subjects who anticipate relatively little or relatively great discomfort while being shocked.

The strong tendency for subjects in the High Fear treatment who anticipate little discomfort to choose the experimental room seems to result from the fact that, for these subjects, the conditions for the arousal of dissonance are best met. These subjects evaluate the reasons for fear as relatively low by expressing little anticipated discomfort and yet they find that according to the meter their fear is seventy-five points greater than the average; thus, the discrepancy between the two kinds of information is greater

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\*By Fisher exact probability test.





for these subjects than it is for subjects in any other condition. For subjects in the High Fear treatment who anticipate relatively great discomfort, there is less discrepancy between the two kinds of information concerning their fear reactions. In addition, these subjects can, on some level of consciousness, use the fact that they anticipate an uncomfortable experience to justify the high fear reaction reported to them; and thus they can reduce any existing dissonance in this way rather than by showing a preference for the experimental room.

Importance and room choice. Asking the subject to estimate the scientific value of the experiment was originally meant to determine how important the subject thought the experiment was and, in essence, how involved he was in participating in the experiment. As reported above, most subjects appeared to be relatively involved in the experiment. Evidence that the more highly involved subjects react more strongly to the experimental manipulations is found by dividing subjects in each treatment group on the basis of room choice and comparing the mean scores of their evaluation of the experiment. These data, presented in Table 7, indicate that, in the High Fear treatment alone, the subjects who chose the experimental room evaluated the experiment significantly higher than subjects in this treatment who chose the waiting room ( $t = 2.110$ ;  $p < .05$ ). The relationship between high evaluation of the experiment and preference for the experimental room does not exist in any other treatment group.

Another way to look at the same data is to dichotomize the subjects in each group near the median according to their evaluation of the experiment and then to compare the frequency with which they chose to wait in the experimental room in preference to the waiting room. These data are presented in Table 8. Since there is great similarity in the responses of males and females,



Table 7

## Room Choice and Evaluation of the Experiment

## Comparison of Mean Evaluation Scores

		Moderate Threat			High Threat
		Low Fear	Average Fear	High Fear	
<b>Males</b>					
Experimental Room					
	Mean	79.50	65.67	75.17	74.00 <sup>a</sup>
	S.D.	17.08	15.04	19.05	4.24
	N	4	3	6	2
Waiting Room					
	Mean	76.82	61.33	62.22	63.92 <sup>a</sup>
	S.D.	12.85	16.61	21.92	24.30
	N	11	12	9	13
<b>Females</b>					
Experimental Room					
	Mean	69.50	57.33 <sup>b</sup>	61.20	67.00
	S.D.	10.61	28.01	10.74	0
	N	2	3	5	1
Waiting Room					
	Mean	70.46	71.75 <sup>b</sup>	61.80	70.86
	S.D.	23.49	18.73	23.27	15.02
	N	13	12	10	14
<b>Males and Females</b>					
Experimental Room					
	Mean	74.50	61.50	77.91 <sup>c</sup>	70.50
	S.D.	13.45	20.62	15.40	5.03
	N	6	6	11	3



Table 7 (continued)

	Moderate Threat			High Threat
	Low Fear	Average Fear	High Fear	
Waiting Room				
Mean	73.64	66.46	62.00 <sup>c</sup>	67.39
S.D.	19.24	18.12	22.01	19.93
N	24	24	19	27

Comparisons of means by two-tailed  $t$  tests:

- a.  $t < 1.0$ ;  $p$  is not significant.
- b.  $t = 1.092$ ;  $p > .10$ .
- c.  $t = 2.110$ ;  $p < .05$ .

Note: This item was scored on a 100 point scale with a score of 100 representing the highest evaluation.





Table 8

## Room Choice and Evaluation of the Experiment

## Number of Subjects Choosing the Experimental Room and the Waiting Room

		Moderate Threat			High Threat
		Low Fear	Average Fear	High Fear	
High Evaluation <sup>a</sup>					
Experimental Room					
	Males	2	2	4	2
	Females	1	1	4	0
Waiting Room					
	Males	6	6	4	6
	Females	7	7	4	8
Low Evaluation <sup>b</sup>					
Experimental Room					
	Males	2	1	2	0
	Females	1	2	1	1
Waiting Room					
	Males	5	6	5	7
	Females	6	5	6	6

Comparison within the High Fear treatment by Fisher exact probability test:

1. High Evaluation vs. Low Evaluation and Experimental Room vs. Waiting Room;  $p = .103$ .

Comparisons between treatments within the High Evaluation group by Fisher exact probability tests:

1. High Fear vs. High Threat and Experimental Room vs. Waiting Room;  $p = .027$ .
2. High Fear vs. Average Fear and Experimental Room vs. Waiting Room;  $p = .062$ .
3. High Fear vs. Low Fear and Experimental Room vs. Waiting Room;  $p = .062$ .



Table 8 (continued)

4. High Fear vs. Average Fear and High Threat combined and Experimental Room vs. Waiting Room;  $p < .01$  (by chi square test; chi square = 10.276).

- a. Above the median.
- b. Below the median.





their data were combined for the analyses discussed below. There is evidence of a weak trend within the High Fear treatment for a greater proportion of the subjects who evaluated the experiment highly to choose the experimental room in comparison with subjects in this treatment who evaluated the experiment relatively low ( $p = .103^*$ ). However, attending only to those subjects above the median for this dimension, comparisons of the High Fear group with the other groups offer more substantial findings. High Fear subjects more frequently chose the experimental room than did High Threat subjects ( $p = .027^*$ ); and they also tended to show a greater preference for the experimental room than did subjects in the Low Fear and Average Fear treatments ( $p = .062^*$ ; data for these two groups are identical). Within the group who evaluated the experiment highly, when Average Fear and High Threat subjects are combined and compared with the High Fear subjects, the latter show a significantly greater preference for the experimental room (chi square = 10.276;  $p < .01$ ).

The strong tendency for subjects in the High Fear group who evaluated the experiment highly to choose the experimental room seems to result from the fact that these subjects experienced a greater amount of dissonance. For in addition to the large discrepancy between cognitions, the fact that these sets of cognitions are important to the subject produces a heightened effect of the experimental manipulations.

Subjective measures. A more indirect way to reduce dissonance, i.e., to find information which would support the experiencing of a level of fear discrepant from normal, would be to find such information in fantasy. Thus, if the subject could imagine something about the experiment to be fearful, such

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\*By Fisher exact probability test.



fantasies would serve the same purpose as choosing to wait in the experimental room. Therefore, examining the subject's description of how he pictures the experimental assistant might offer another way to measure dissonance reduction. Inspection of these data reveals no significant differences between experimental groups on mean scores of each dimension included in the description of the assistant's personality and his physical characteristics (see Appendix D for means). However, a comparison of subjects choosing the experimental room with those subjects choosing the waiting room reveals differences between the High Fear group and other experimental groups in terms of the subject's description of the assistant's personality characteristics; such differences are not evident in the subject's description of his physical characteristics. As compared with other groups, subjects in the High Fear Treatment who chose the experimental room, i.e., those subjects in whom the arousal of dissonance was most effective, tended more frequently to describe the assistant as warm, kind, careful, unfriendly and inconsiderate. The obviously contradictory nature of these findings suggests the possible existence of a not-yet discovered, higher-order relationship between these dimensions and some other variable; it also suggests the need for a more precise measure of subjective impressions to be used in future research as an indication of dissonance reduction. (See Appendix E.)

#### Effects of Ordinal Position

In most of the studies discussed above that involve the desire to affiliate as a measure of the need for social comparison (Gerard and Rabbie, 1961; Radloff, 1961; Sarnoff and Zimbardo, 1961; Schachter, 1959) a relationship was demonstrated between the individual's desire to affiliate and his





ordinal position in the family. Affiliative tendencies of first born and only females are clearly more strongly effected by the manipulation of fear than are those of later born females (Radloff, 1961; Schachter, 1959); Gerard and Rabbie (1961) support this finding for females but find that it is later born males who respond more strongly to the fear manipulation by seeking affiliation. Sarnoff and Zimbardo (1961) offer evidence that first born and only males are more responsive than later born males. Analysis of the data from the present study indicates that the manipulation of information used to arouse dissonance produced a significant difference in room choice between first and only children and later born children. These results are quite consistent with the findings of Gerard and Rabbie in that the effect of the manipulation is strongest for first and only females and for later born males. These data, presented in Table 9, indicate that under conditions of dissonance arousal (High Fear but not Low Fear) a greater proportion of first and only born females chose to wait in the experimental room ( $p = .031^*$ ); females in the control treatments did not show such a preference. Among males, it is the later born subjects who, under conditions of dissonance arousal (High Fear but not Low Fear) demonstrate a preference for the fear-arousing situation when compared with males in control treatment groups ( $p = .030^*$ ). If subjects in the High Fear treatment who chose the fear-arousing situation are divided on the basis of sex and birth order, there is further evidence that it is the first and only born females and the later born males who make such a choice ( $p = .012^*$ ).

Within the High Fear treatment, first and only born subjects did not differ from later born subjects in their anticipation of discomfort in the ex-

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\*By Fisher exact probability test.





Table 9

## Ordinal Position and Frequency of Room Choice

		Moderate Threat			High Threat
		Low Fear	Average Fear	High Fear	
Experimental Room					
First Born					
Males	4	2	1	1	
Females	2	1	5	1	
Later Born					
Males	0	1	5	1	
Females	0	2	0	0	
Waiting Room					
First Born					
Males	7	6	6	8	
Females	8	8	6	9	
Later Born					
Males	4	6	3	5	
Females	5	4	4	5	

Comparison within High Fear treatment by Fisher exact probability test:

1. Of those who chose the Experimental Room: Males vs. Females, First Born vs. Later Born;  $p = .012$ .

Comparisons across treatments by Fisher exact probability test:

1. First Born Females: High Fear vs. Average Fear and High Threat combined and Experimental Room vs. Waiting Room;  $p = .031$ .
2. Later Born Males: High Fear vs. Average Fear and High Threat combined and Experimental Room vs. Waiting Room;  $p = .030$ .



perimental situation. However, first and only born subjects, both male and female, in the Low Fear treatment anticipated significantly more discomfort than later born subjects in this treatment did ( $p = .025^*$ ). Data for these findings are presented in Table 10. No significant differences in their evaluation of the experiment were evident between first and only children and later born children in any of the treatment groups (see Appendix F for data).

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\*By Fisher exact probability test.





Table 10

## Ordinal Position and Anticipation of Discomfort

		Moderate Threat			High Threat
		Low Fear	Average Fear	High Fear	
Much Discomfort					
First Born					
	Males	6	3	4	5
	Females	7	4	4	4
Later Born					
	Males	2	5	5	3
	Females	1	4	3	4
Little Discomfort					
First Born					
	Males	5	5	3	4
	Females	3	5	7	6
Later Born					
	Males	2	2	3	3
	Females	4	2	1	1

Comparison within the Low Fear treatment by Fisher exact probability test:

1. Much Discomfort vs. Little Discomfort and First Born vs. Later Born;  $p = .025$ .

Note: Sexes were combined for this analysis since no differences between sexes were apparent.



## Chapter IV

### DISCUSSION

The results of the present research offer support for the proposal that under conditions of emotional arousal, an individual can experience dissonance created by the information that his emotional reaction is inappropriate to the stimulus situation. It was suggested that dissonance aroused in such a manner could be reduced by finding evidence in the external environment to support the emotional reaction. The work of other investigators has led to the proposal that one way to reduce dissonance of this type is for the individual to find evidence that his reaction is not abnormal by establishing that others, in the same or similar situations, have the same types of reactions. A theoretically significant contribution of the present study is the demonstration that a means of reducing dissonance, other than through social support, exists in the individual's finding stimuli in the environment to support his reaction and make it seem appropriate. Implicit in this finding is support for the proposal that affiliation with others may serve to justify a questionable emotional reaction and thus it can be considered to be a type of dissonance reduction.

Another important contribution of this study is in the form of support for dissonance theory by its application in a previously untested situation. By demonstrating that an individual who experiences two conflicting cognitions



manifests changes in behavior different from those of an individual who does not experience such conflicts, support is gained for Festinger's proposal (1957) that "dissonance, that is, the existence of nonfitting relations among cognitions, is a motivating factor in its own right." In addition to supporting the theory, this study also demonstrates that the theory, one concerning cognitive functioning, adds to the understanding of previously unexplored aspects of emotional behavior.

As is frequently the case in laboratory studies using humans as subjects, the effects of the manipulations in the present study were, for some subjects, somewhat weaker than those resulting from a spontaneous emotional situation would be. The threat manipulation appeared to have the same effects on all subjects; however, there is evidence, most clearly within the High Fear group, that reactions to the information manipulation were more individually determined. It is conceivable that even in the face of "scientific evidence," i.e., the meter, some subjects in the High Fear and Low Fear groups refused to believe that their responses were deviant enough to be considered significantly different from average. Possibly for other subjects, who may have believed that their responses were indeed deviant, being deviant in an experimental situation did not have the same impact as being deviant in "everyday life" would.

#### Questionable Aspects of the Study

Attractiveness of the rooms. It was expected that the Low Fear subjects would experience dissonance and attempt to reduce it by showing a preference for the neutral situation, i.e., the waiting room. Such a choice would serve as justification for experiencing a low level of fear. Because no





dissonant information was introduced in the Average Fear and High Threat groups, these subjects were not expected to experience dissonance; and, therefore, they were not expected to demonstrate a preference for either room. It was expected that dissonance would be aroused in subjects in the High Fear treatment and that they would therefore show a preference for the fear-justifying situation, i.e., the experimental room. However, there apparently were several factors, other than dissonance reduction, which influenced the subjects' choice of rooms. Subjects in the Average Fear and High Threat groups were not expected to be concerned about justifying their reactions and therefore were not expected to show a preference for one room over the other. However the chance to read magazines to pass the time seemed to have greater appeal to those subjects who were unconcerned about their reactions than the chance to look at the experimental room did. It is also possible that choosing the waiting room was a way of avoiding a fear-arousing situation, for being exposed to a fearful situation might be uncomfortable for the subject. Thus, it is reasonable to assume that the attractiveness of the waiting room increased for a reason extraneous to the problem being investigated.

Because the Average Fear and High Threat groups demonstrated a preference for the waiting room, as did the Low Fear subjects, it is impossible to know whether or not the Low Fear groups' choices were motivated by a desire to reduce dissonance, as it was predicted they would be. Although these three groups manifested the same behavior in the experiment, the following possibilities are suggested to differentiate between the Low Fear and control groups. (1) Even though the control groups demonstrated a preference for the waiting room for reasons extraneous to the hypothesis being tested, it is entirely possible the Low Fear group did choose the waiting room as an attempt to reduce dissonance, as it was predicted they would. Thus, the ex-



pression of the same behavior by the Low Fear group and the control groups could have been the result of two very different sets of motivations. However, it is impossible to establish the validity of this explanation because of the imbalance in the attractiveness of the two rooms. If room choice is to be used as a dependent measure in future research, the importance of equating the rooms for attractiveness cannot be overemphasized. (2) Another possible explanation for the lack of significant differences between the choices of the Low Fear group and the control groups is that the information manipulation might have had a weak effect on the Low Fear subjects. The assumption was made that informing an individual that his emotional response was below the average would have the effect of creating dissonance, just as would telling him that his response was greater than the average. The question arose early in the experiment of whether individuals who were informed that their reactions were below the average experienced the same amount of dissonance as subjects in the High Fear group did. When informed of the discrepancy between their reactions and the norm, subjects in the Low Fear group were perhaps more easily able to resolve the conflicting cognitions. They generally seemed quite pleased when informed of their lower-than-average reaction. Since it is socially acceptable and even praiseworthy to "under-react" in fearful situations, informing the subject that his fear was below average might have meant to him that he was, in fact, better than the other subjects who set the norm; and such a reassuring thought would certainly be dissonance reducing. Although information which implies that one is better than average is dissonant with the cognition of being average or normal, there is little need to maintain the latter cognition; there is only pressure to retain it when the dissonant cognition implies that one is in some way abnormal. Thus, the cognition of being average is easily given up when there is evidence





to support the cognition which implies being better than average. Some support for this line of reasoning is found in the informal comments made by the Low Fear subjects during the experiment. These comments included statements such as, "I never have been as frightened as others about electricity," or "I sometimes try to shock myself on a lamp just to feel it," or "I don't know why I was worried that the meter would go all the way up, I don't usually get frightened sometimes when others do." Such comments appear to act as reinforcement for the cognition of under-reacting and, in doing so, being better than others. Subjects in the High Fear group tended to recall other past events or to present themselves somewhat differently from the Low Fear subjects. More common in the High Fear group were remarks such as, "I always seem to get so scared even when some of my friends don't. [Pause] It's so embarrassing," or "I guess I expected a high score because once I got shocked and it really made me jump." The responses of both groups, although only informal comments, appear to be attempts to justify their reactions. There certainly appears to be some selectivity involved in recalling past experiences, for certainly most subjects had experienced both situations where they were more frightened than they thought they should be and situations where they were less frightened. For the Low Fear subjects, it is possible that the justifying remarks were sufficient to reduce dissonance. Perhaps only minimal justification was necessary to support the cognition of being better than average because the individual had a strong desire to maintain that cognition and because he, in some ways, already believed that about himself.

Both of these explanations suggest that dissonance was created in the Low Fear group. The first suggests that the choice of the waiting room was an attempt to reduce dissonance but that this motivation was masked by the control groups' also choosing the waiting room, for reasons extraneous to the



problem. The second explanation is that while dissonance was created by the discrepant cognitions, it was easily reduced by the subject's finding enough justification to maintain the preferred cognition through recall of past events. A third possible explanation is that the manipulation was totally ineffective and that dissonance was not created in this group. Although the argument against such an interpretation is not based on a great quantity of strongly convincing experimental evidence, the line of reasoning in both explanations appears to be sound. Certainly there is no definitive evidence which indicates that dissonance did not occur. A final resolution, of course, depends upon further, more clearly interpretable research in this area.

When investigating the affiliative tendency, Schachter (1959) offered his subjects the choice of waiting with others or waiting in a room furnished with some magazines. The latter choice is the same as that offered to the subjects in the present experiment. The instructions in this experiment were similar to those used by Schachter; therefore one can assume that the subjects experienced a comparable "amount" of threat. However, Schachter's subjects did not show the preference for the waiting room that was so marked in this research. At first glance one may want to infer that, since the conditions in the two experiments were similar except for the choice offered as an alternative to the waiting room, affiliation with others is a more preferred source of dissonance reduction. However, it must be noted that Schachter used a somewhat different method of measuring the subjects' choices. Although two situations were available, waiting with others or waiting alone, the subjects could indicate preferences by checking one of the following alternatives: together, alone, or don't care. Regardless of which of the many comparisons were involved, relatively few subjects chose to wait alone; and the majority of the subjects indicated that they didn't care in which situa-





tion they waited. Significant findings were based on the fact that of those who chose to wait together, a greater proportion were exposed to the high anxiety manipulation. In essence, these results are quite similar to those in the present study. It appeared that the subjects in this study who chose the waiting room were not very committed to this choice, but rather that they chose this room because it offered something to pass the time. It seems quite likely that the majority of these subjects would have indicated that they didn't care where they waited, if this alternative were offered to them.

Subjective measure. Since there were no systematic differences in the responses given by the four treatment groups to the questionnaire item concerning expectations about the experimental assistant, it is apparent that this type of approach through fantasy is even less effective than room choice as a way of measuring attempts at dissonance reduction. Possibly subjects did use fantasy as a source of dissonance reduction but, if so, this item did not adequately measure it, perhaps because the subjects, who were fairly sophisticated college students as compared with the eleven-year-old girls Murray (1933) used, were too reality-oriented to offer entirely negative ratings of the assistant. Some subjects in the High Fear group, on some level of consciousness, might have pictured the assistant as an oversized bully who was cold, mean, unfriendly, careless, and inconsiderate; but they did not express these fantasies. Perhaps their experiences with other assistants who were not like this made them fear that such descriptions would appear irrational; or perhaps many felt that expressing a negative opinion about someone they had not met would be socially inappropriate. Whatever the specific reasons were which might have prevented the subjects from expressing their fantasies, one major fault with this type of question seems to be that it involves a description of an actual person. Although the subjects had not met





the assistant and were told that an accurate description was not expected, the fact that the assistant did exist might have made the subjects reluctant to describe him at either extreme; for if they did so, their answers could be evaluated as right or wrong when compared with the actual person's characteristics. The real advantage of projective techniques, such as the Thematic Apperception Test which grew out of Murray's informal experiment with the young girls, is that they are far enough removed from reality to make most people feel that they are not talking about specific others.

However, it is also possible that the questionnaire was ineffective because subjects did not use fantasy to reduce dissonance. The use of fantasy may be a relatively less effective way of reducing dissonance which an individual resorts to only when other means fail or are inaccessible. Since the dissonance aroused in this study was perhaps not as great as that aroused by other situations, possibly other means of reducing dissonance, such as exposure to justifying stimuli or the use of defenses such as rationalization or denial, which were accessible to the subject, were adequate enough to cope with the situation. Unfortunately, it is impossible to determine whether the failure of the questionnaire item to differentiate between experimental groups results from the fact that it was an insensitive and improperly designed measure or from the fact that what it purported to measure, i.e., dissonance reduction through fantasy, did not occur in this experimental situation.

#### Alternative Explanations of the Findings

Another possible explanation of the High Fear group's tendency to choose the fear-provoking situation is that they did so to prove that they were not frightened by the situation. Choosing the experimental room would be a way



of "counteracting" the information recorded on the meter, i.e., that they were more frightened than average; such a choice would demonstrate that they were not afraid to face the situation. However, the reactions of the High Threat subjects suggest that such an interpretation may not be entirely appropriate. These subjects certainly experienced more fear than the High Fear subjects, as measured by their anticipation of discomfort; and, thus, they too would be expected to attempt to prove that they were less frightened by choosing to "face" the frightening stimuli. The High Threat subjects were not confronted with the information that they were more frightened than average; therefore they did not have to demonstrate, by choosing the experimental room, that they were not deviant from the norm. However, if choosing the experimental room did, in fact, represent to the subject a chance to prove that he was unafraid, it would have been to the advantage of the High Threat subject, who actually felt frightened, to be able to convince himself and others that there was nothing to be afraid of. The fact that the High Threat subjects did not act this way suggests that an interpretation of the findings in terms of the subject's trying to prove that he was unafraid is not appropriate. Additional evidence against such an interpretation is found in the fact that the tendency to choose the fearful situation was greatest for those subjects for whom the discrepancy between anticipated discomfort and reported fear was the greatest. To reiterate, those subjects in the High Fear group who scored below the median on amount of discomfort they anticipated in the experiment showed the strongest tendency to choose the experimental room. The fact that this finding occurred only in the dissonance-arousing condition offers support for the applicability of a dissonance interpretation. Only if the results had indicated that those subjects who anticipated relatively great discomfort tended to choose the fearful situation would there be support for





the interpretation that the subject's choice was an attempt to prove that he was unafraid of the situation.

#### Application of the Findings to Non-experimental Situations

Even though, for many subjects, the experimental situation was a weaker representation of a spontaneous experience, the contention is plausible that most people at some time experience emotional reactions that appear to be inappropriate to the precipitating situation and that they attempt to deal with such an experience by seeking external support for their reactions. Thus the relationship established between experiencing an inappropriate emotional reaction and choosing to be exposed to stimuli which justify such a reaction would seem to have wide generality.

Outside of the laboratory, incidents frequently arise in which an individual is unsure of the appropriateness of his emotional reaction and he may seek to justify it either through affiliation with others or through supporting non-social stimuli, or possibly through a combination of these. Examples may be found in individuals who are fearful of a nuclear war. Since the majority of the population does not openly appear to be frightened by the possibility of nuclear attack, an individual may feel that the extent of his concern is without realistic basis, i.e., he may think that there is a discrepancy between the extent of his reaction and the extent that is normal for the situation. He may choose to deny the possibility of nuclear war and refuse communication which would suggest otherwise. An alternative would be for him to decide that the rest of the population is wrong in their apathy and then he would avoid information that supported a lack of concern. In such an



instance, an individual might choose to affiliate with others who also admit to being frightened and thus establish a new norm, which would reduce the discrepancy between his feelings and the norm; the appropriateness of his level of fear would be reinforced. Finding that everyone else in this selected group is also frightened would reassure him that indeed it is appropriate to be frightened. However, building a fallout shelter would also be reassuring, for the structure might serve as a "justifying stimulus." The shelter might serve to convince him that attack is imminent; he might reason, "I have built a fallout shelter, so therefore I believe war is imminent and I have a right to be frightened." In addition to this preparation, the individual may seek social support by attempting to convince others of the appropriateness of his activity and encourage them to do the same thing. Their compliance would add further support to his feeling that being frightened is an appropriate response. A dissonance interpretation would suggest that individuals who build fallout shelters do not feel less frightened as a result, but rather, they appear to feel more comfortable about being frightened.

#### Ordinal Position

Schachter (1959), Gerard and Rabbie (1961), and Radloff (1961) clearly demonstrated with female subjects that first born and only children showed greater affiliative tendencies than later borns did in threatening situations which involved some uncertainty concerning emotions or opinions. The results of the present study indicate that first born and only female subjects react more strongly to dissonance arousing situations by more frequently choosing to expose themselves to the fear-justifying stimuli. Thus, it appears that ordinal position affects situations other than those involving affiliation.





Since it has been suggested that situations such as those created by Schachter, Gerard and Rabbie, and Radloff are, in fact, dissonance-arousing, the birth order phenomenon would also be expected to occur in a dissonance-arousing situation that does not involve affiliation as a source of dissonance reduction. This expectation is based on the assumption that ordinal position is in some way related to the independent variable, i.e., uncertainty about one's reactions, rather than specifically to the dependent measure, affiliation. In other words, there is something about the experimental situation which differentially affects subjects, depending upon their ordinal position in the family; and this relationship would occur whether the dependent measure involved affiliation or some other variable. Thus, it might be more appropriate to say that first born and only female subjects for some reason react to ambiguously defined situations by demonstrating increased need for affiliation, dissonance reduction, or whatever other measure may be involved. Others (Becker and Carroll, 1962; Staples and Walters, 1961) have demonstrated that ordinal position is related to variables such as susceptibility to social influence and tendencies to conform. Dittus (1961) has suggested that first born individuals have greater tendencies to conform and to use impulsive judgment, especially when they are unsure of acceptance by others. None of these experiments involved affiliation as a dependent measure; however these findings appear to be consistent with Schachter's interpretation of the relationship between birth order and affiliation as stemming from the heightened dependency needs of the early born subject. Schachter offers a variety of studies (Beller, 1948; Beller, 1957; Dean, 1947; Gewirtz, 1948; Haerberle, 1958) to support his claim that first born and only children have greater dependency needs than later born individuals do. However, it has not yet been demonstrated how the heightened dependency needs actually affect these subjects.





Possibly, early born individuals are more dependent on other people to serve as sources of anxiety reduction. Certainly when considering the treatment that the first born or only child receives during childhood, it seems reasonable to suggest that the parents responded more quickly and with more concern and reassurance to the anxious moments of their first child; with later children, they could perhaps be more relaxed and casual in such situations. Thus, the child may have learned to rely on others in moments of stress. Another possible interpretation of the early born individual's greater desire to affiliate in anxiety-producing situations is that he is responding as any other person would, i.e., seeking the support of others in such moments, but that the situation is more anxiety-arousing to him either because he is more susceptible to anxiety arousal or because he is more attendant to environmental cues, and thus he reacts more readily. The former contention, that of being more susceptible to anxiety arousal, is partially supported by many investigations which suggest that the early born individuals are more prone to develop personality problems (Rosenow, 1930; Armstrong, 1933; Breckenridge and Abbott, 1912). A psychoanalytic interpretation, applicable to first borns but not to only children, would suggest that the feeling of being replaced by later children or the feeling of having to share parental affections might contribute to the insecurity of the first born, thus making him more susceptible to anxiety arousal. The latter contention, that of being more attendant to environmental cues, is supported by Witkin's (1954) finding that individuals who express dependency needs in social situations tend more often to be field dependent than body dependent; that is, they rely more on external cues than they do on internal ones. Implicit in this interpretation is that field dependent individuals are less self-reliant, for generally field dependency is associated with an early developmental stage, i.e., children and immature adults



tend to be <sup>field</sup> ~~more~~ dependent. Witkin (1959) explains, "Ability to orient one's own body independent of the surrounding visual field or to keep an object separate from its background thus seems directly associated with capacity to function with relative autonomy of the social milieu in everyday life." Thus demonstrating that females tend to be field dependent, as Witkin (1954) did, is quite compatible with the findings that they show greater tendencies to affiliate, to conform, and to respond to social influence. However, since Witkin's findings indicate that females respond more readily to most environmental cues, in addition to those involving association with others, the possibility exists that they would, in fact, react more strongly to any type of experimental manipulation. To interpret the finding that first and only born females react more strongly to experimental manipulations because they are more dependent on external cues is a relatively reasonable deduction although perhaps not entirely the answer. However, when generalizing these findings to males, the issue becomes less clear; different experiments offer contradictory evidence as to whether it is the first born male or the later born male who is more affected by the manipulations. Results of the present study indicate that the later born male shows stronger tendencies to choose the dissonance reducing situation. Others, who have found that it is the later born male who demonstrates increased affiliative tendencies, have modified the explanation which implies that first born individuals have greater dependency needs. They suggest that it is the first born female and the later born male who have the strongest dependency needs resulting from differential treatment during childhood. This modification is based on the reasoning that the first born male is encouraged to become independent and thus be ready to act as head of the family, if need be.





In none of these investigations were the later born males divided according to whether or not they were first born of their sex. No doubt, a male child preceded in ordinal position by one or several females receives different treatment by his parents and siblings than does a male preceded by other males. Such an analysis was not possible in the present study, for the number of later born males when further divided would be too small to allow for meaningful interpretations. Research by Koch (1956) suggests different types of relationships between variables occur depending upon the difference in age between an individual and his sibling; perhaps further investigations along this line would be fruitful.

In attempting to explain why first born females and later born males show greater needs to reduce dissonance, several possibilities can be suggested. (1) Possibly, these subjects are more dependent on external cues than other subjects are. Therefore, because of their attentiveness, they easily discern conflicting evidence and thus experience dissonance more readily than others do. (2) Another possibility is that they have a low threshold for emotional arousal; and therefore, any emotional situation has a greater impact on them. The importance of the situation, in such a case, would be heightened and thus the introduction of discrepant information would create a greater amount of tension. (3) A third possibility is that because of their anxieties being attended to more readily in childhood, these subjects have a lower tolerance for uncomfortable situations; and thus, in dissonance-arousing situations, they experience less tolerance and have a greater need to reduce dissonance. (4) A fourth possibility is that, because of a greater need to conform, the feeling of being different from others or acting inappropriately arouses more dissonance in these subjects.

The possible interpretations of the birth order phenomenon suggest the



question of whether the important variable which causes some subjects to respond more readily to experimental manipulations of emotional situations is dependency rather than ordinal position. It has been suggested that first born females, later born males, and, by some investigators, first born males behave the way they do because of stronger dependency needs. It would then seem that all dependent individuals should act this way. The fact that many first born children tend to be dependent may have obscured the real issue.

#### Implications for Further Research

A more convincing test of the applicability of dissonance theory to emotional situations could be obtained by essentially replicating the present study, but improving the dependent measures. Important improvements would involve balancing the attractiveness of the rooms, designing a more sensitive projective measure, and including a questionnaire to measure how strongly the subject desires to wait in the room he chooses. In addition to demonstrating more clearly the effects of dissonance in the High Fear group, such modifications might help to clarify whether subjects in the Low Fear treatment do experience any dissonance or whether they react essentially like a control group.

Additional information could be obtained by including another treatment group. In the High Threat condition, it might be interesting to include a group which is exposed to the information that their scores are higher than average. Such a manipulation might reveal that under conditions of High Threat, the introduction of discrepant information would produce stronger tendencies to choose the fear-justifying situation, suggesting a combination of the motivating forces of fear and dissonance.





Further support for the hypothesis tested in this research could be gained by repeating the study using similar, non-social means of dissonance reduction and involving some emotion other than fear. Emotions such as anger, hate, grief, or pity, to suggest only a few, might be worked into interesting experimental situations.

In addition to repeating the present study with certain modifications, other lines of investigation could add to the understanding of emotional behavior through the application of dissonance theory. The present hypothesis grew out of a reinterpretation of studies involving affiliation in emotional situations. However, there was no evidence to prove that social comparison theory was wrongly applied to these findings; nor was there evidence to prove that dissonance theory was wrongly applied. In these studies one could offer a convincing case for the appropriateness of either theory. The present research offers evidence that in emotional situations when affiliation with others is not available, subjects choose to expose themselves to fear-arousing, or more appropriately fear-justifying, stimuli; such behavior is easily explained by dissonance theory and no explanation is possible based on social comparison theory. It is now essential to demonstrate experimentally that in ambiguously-defined situations when affiliation with others is offered, the subject's desire to affiliate is motivated by the need to reduce dissonance rather than by the need for social comparison.

An experiment designed to pit one motivational source against the other would demonstrate which dominant. For example, one might set up a situation involving the subject's demonstration of his adequacy in heterosexual relationships. After receiving information implying that he is inadequate, his choice to affiliate with members of the opposite sex could be interpreted as an attempt to reduce dissonance. If, in this situation, he demonstrated a



THEORY OF THE EARTH AND ITS HISTORY

The theory of the earth and its history is a branch of geology which deals with the origin and development of the earth and its various parts. It is a science which seeks to explain the processes which have shaped the earth and its features, and to determine the time and sequence of these processes. The theory of the earth and its history is based on the study of the earth's rocks and fossils, and on the principles of geology. It is a science which is constantly developing, as new discoveries are made and new theories are proposed. The theory of the earth and its history is a branch of geology which deals with the origin and development of the earth and its various parts. It is a science which seeks to explain the processes which have shaped the earth and its features, and to determine the time and sequence of these processes. The theory of the earth and its history is based on the study of the earth's rocks and fossils, and on the principles of geology. It is a science which is constantly developing, as new discoveries are made and new theories are proposed.

preference for members of his own sex, then one could attribute his behavior to the need for social comparison. It would be important to offer the subject the chance to refuse affiliation. Thus, he would not be forced to make a choice between these two types of situations. All choices could then be interpreted as motivated by attraction to one of the situations, excluding the possibility of their being motivated by avoidance of the other situation.

An experiment such as the one described above would contribute further to the understanding of the cognitive aspects of emotional behavior. However, many questions about emotional behavior would still remain unanswered. Eventually, it seems, all of the information gained through the exploration of cognitive processes will have to be coordinated with information gained through physiological research, in order to have a complete picture of what happens to an individual when he is confronted with an emotion-arousing stimulus.



## APPENDIXES





## Appendix A

Name:

Local address:

Age:

Person to notify in case of emergency (local):

Address :

Parents' name :

address :

Siblings' names

sex

ages

Medical history (check those that you have now or have had):

rheumatic fever \_\_\_\_\_

high blood pressure \_\_\_\_\_

heart condition \_\_\_\_\_

low blood pressure \_\_\_\_\_

epilepsy \_\_\_\_\_

other (specify) \_\_\_\_\_



## Appendix E

### PHYSICAL AND ATTITUDINAL STATUS

1. Approximately how many hours sleep did you have last night? \_\_\_\_\_
2. How many hours ago did you have your last full meal? \_\_\_\_\_
3. Do you feel any of the following symptoms now? (please check)

sniffles

sore muscles

headache

sore throat

4. How much discomfort do you expect to feel in this experiment?



5. Use your imagination and describe how you picture the assistant who will be administering the shocks.

height

age

weight





6. How scientifically valuable do you think this type of experiment is?







# Appendix C

## DEVIATION OF SUBJECTS' GUESSES FROM GIVEN NORM

	Moderate Threat <sup>a</sup>			High Threat <sup>b</sup>
	Low Fear	Average Fear	High Fear	
<b>Males</b>				
Mean	+20.0	-2.0	+1.0	+2.3
S.D.	26.65	17.70	21.19	52.32
Absolute				
Mean	23.3	13.3	15.3	29.0
Absolute				
S.D.	23.57	11.28	14.08	42.93
<b>Females</b>				
Mean	+13.0	+7.0	+1.0	+3.6
S.D.	26.71	14.74	16.27	17.47
Absolute				
Mean	17.0	10.3	11.0	9.6
Absolute				
S.D.	24.18	12.46	11.68	14.81

a. Given norm = 75.

b. Given norm = 150.



# Appendix D

## RATINGS OF THE ASSISTANT

		Moderate Threat <sup>a</sup>			High Threat <sup>b</sup>
		Low Fear	Average Fear	High Fear	
<u>Warm-Cold<sup>a</sup></u>					
Males					
Mean	3.0	3.0	2.8	2.8	
S.D.	.688	.911	.722	.950	
Females					
Mean	3.0	2.9	3.0	3.2	
S.D.	.859	1.005	.471	.944	
<u>Kind-Mean</u>					
Males					
Mean	3.3	3.3	3.2	3.1	
S.D.	.671	.732	.696	.931	
Females					
Mean	3.6	3.4	3.3	3.9	
S.D.	.562	.803	.530	.466	
<u>Friendly-Unfriendly</u>					
Males					
Mean	3.1	3.2	3.3	3.1	
S.D.	.523	.769	.634	.733	
Females					
Mean	3.5	3.5	3.4	3.7	
S.D.	.586	.645	.512	.787	
<u>Careful-Careless</u>					
Males					
Mean	4.2	3.7	4.2	3.7	
S.D.	.619	.832	.461	.839	
Females					
Mean	4.5	4.3	4.4	4.4	
S.D.	.379	.473	.600	.569	





## Appendix D (continued)

	Moderate Threat <sup>a</sup>			High Threat <sup>b</sup>
	Low Fear	Average Fear	High Fear	
<u>Considerate-Inconsiderate</u>				
Males				
Mean	3.6	3.8	3.7	3.3
S.D.	.871	.695	.776	.778
Females				
Mean	4.1	4.0	4.1	4.3
S.D.	.598	.634	.589	.429
<u>Height (inches)<sup>b</sup></u>				
Males				
Mean	70.7	70.5	69.8	70.1
S.D.	.976	1.058	1.569	2.099
Females				
Mean	70.3	70.3	70.3	71.1
S.D.	2.052	2.865	1.800	1.792
<u>Weight</u>				
Males				
Mean	167.0	160.7	165.0	164.5
S.D.	10.975	10.149	13.748	11.681
Females				
Mean	171.6	163.3	166.0	169.0
S.D.	14.143	12.329	15.010	6.868
<u>Age</u>				
Males				
Mean	27.1	27.5	28.4	26.8
S.D.	5.635	5.197	5.740	5.631
Females				
Mean	27.7	26.2	26.4	28.7
S.D.	5.053	3.899	5.699	7.905

a. The first five items were scored on a 5 point scale with a score of 5 representing the most favorable rating.

b. The last three items were not scaled but allowed for free responses.



# Appendix E

## ROOM CHOICE AND EVALUATION OF THE ASSISTANT

	High Fear	Controls	High Fear	Controls
<u>Warm<sup>a</sup></u>				
<u>Cold<sup>b</sup></u>				
Experimental Room	5	5	6	11
Waiting Room	9	37	10	37
$p = .038^c$			$p > .10$	
<u>Kind</u>				
<u>Mean</u>				
Experimental Room	7	6	4	9
Waiting Room	7	36	12	39
$p = .011$			$p > .10$	
<u>Friendly</u>				
<u>Unfriendly</u>				
Experimental Room	4	5	7	10
Waiting Room	11	41	8	34
$p > .10$			$p = .078$	
<u>Careful</u>				
<u>Careless</u>				
Experimental Room	8	7	3	8
Waiting Room	10	42	9	33
$p = .057$			$p > .10$	
<u>Considerate</u>				
<u>Inconsiderate</u>				
Experimental Room	4	9	6	8
Waiting Room	11	35	9	33
$p > .10$			$p = .032$	

a. Above the median.

b. Below the median.

c. By Fisher exact probability test.

Note: Because there were no apparent differences between sexes, their data were combined for this analysis.



# Appendix F

## ORDINAL POSITION AND EVALUATION OF THE EXPERIMENT

	Moderate Threat			High Threat
	Low Fear	Average Fear	High Fear	
<u>High Evaluation<sup>a</sup></u>				
Males				
First Born	6	5	3	6
Later Born	2	3	5	3
Females				
First Born	5	5	6	6
Later Born	3	3	2	2
<u>Low Evaluation<sup>b</sup></u>				
Males				
First Born	5	3	4	3
Later Born	2	4	3	4
Females				
First Born	5	4	5	4
Later Born	3	3	2	3

a. Above the median.

b. Below the median.





## Appendix G

### COMPLETE INSTRUCTIONS TO THE SUBJECTS

This experiment is designed to test your sensitivity to electric shock. The actual experiment will not take place in this room, but perhaps you noticed as you came here that there are several rooms on this corridor--one of these is the experimental laboratory to which I'll take you in a few minutes. I have an assistant whose name is Mr. Butler and he will conduct the rest of the experiment with you. But first, because of the nature of the experiment, I felt that I wanted to talk to each subject--to explain just what would be happening to you and to get certain information from you.

Here is a routine information sheet that I'd like you to fill out. It calls for information such as your name, address, and so on. In addition to the information called for, would you also include your major, if you've decided on one. Anywhere on the sheet will be fine. [Subject fills out information sheet which appears in Appendix A.]

Now I'd like to tell you a little bit about what will be happening to you in the experiment, so you'll know just what to expect.

Instructions to Moderate Threat groups. The experimental assistant, Mr. Butler, will give you a series of electric shocks, a maximum of ten. He'll begin with a very mild shock and each one will be increasingly stronger than the last. One of the purposes of the experiment is to see how people define pain in terms of this series of shocks. What we want you to do is to indicate when you feel the shocks are becoming painful and this is where the ex-



periment will stop. Of course, you will not be given the remaining shocks. So you see, you can avoid any great discomfort by indicating at the proper time that you want to stop the experiment. You understand, we don't want you to be a martyr and try to take all of the shocks; that isn't the purpose of the experiment. On the other hand, we don't want you to stop too early, but just at the point that you would define as becoming painful. Do you have any questions about what will be happening or about what we expect you to do? Do you feel that you want to continue with the experiment?

Instructions to High Threat group. The experimental assistant, Mr. Butler, will give you a series of electric shocks, a maximum of twenty-five. He'll begin with a mild shock and each one will be increasingly stronger than the last. One of the purposes of the experiment is to see how people define pain in terms of this series of shocks. What we want you to do is to indicate when you feel that the shocks are becoming painful. However, there is another purpose of the experiment. It is to demonstrate that psychological pain--the feeling that something hurts--is different from physiological pain, which is defined as a muscle contraction or spasm. In order to demonstrate this difference between psychological pain and physiological pain, which in most cases occurs after the experiencing of psychological pain, it will be necessary to continue shocking you after you feel pain, until we can record a muscle contraction. In most cases the contraction occurs about shock number twenty-five, but in any case we will stop at this point. Most people feel that the shocks become painful somewhere between shocks number twelve and sixteen.

I guess you realize that you will feel considerable discomfort with the later shocks. However, I'm encouraging you to continue with the experiment because it will give us important scientific information. I feel that I should





apologize to you for asking you to take part in such a painful experiment, but as I said, it is very important that this type of information be gathered. I really hesitated to do this type of experiment, but I've found that most people are willing to go through with it. I have been through the experiment myself and I will honestly say that it is very uncomfortable. However, I can promise you that there will be no aftereffects, in the form of burns, sore muscles, or a headache. And certainly, there will be no permanent damage. Do you have any questions about what will be happening to you or what we expect you to do? Do you feel that you want to continue with the experiment?

I am also interested in studying emotional reactions to being shocked. You probably realize that how frightened an individual is of being shocked has a great effect on how he will react to the shocks. What I'd like to do now is to get a measure of your level of fear now, while you're anticipating the experimental procedure. Then we can compare this measure with other measures taken during the experiment. To get this measure, I'm going to place this cuff on your arm and record your reaction on this meter. Is that O.K. with you? [Experimenter walks to subject's side.] Before placing the cuff on your arm, I'm going to wipe your wrist with this solution. [Experimenter uses gauze pad to wipe subject's wrist with water.] Now, while that's drying, let me tell you a little about the measure I'm using. This is a measure of skin resistance. Perhaps you've already heard of it in your psychology class. It's called the galvanic skin response, that is, the GSR. It's based on the idea that when you become frightened, the amount of moisture on the surface of your body increases. You may notice that when you become very frightened you perspire noticeably--like before an exam, you may feel your hands become wet. Well, sometimes moisture increases because one part of



the body is against another part--like holding your hands clenched. That is why we use the wrist. It is a more stable place to take this measure because any increases in moisture can be considered the result of fear rather than because of two parts of the body touching. Now, your reaction will appear on this meter. Notice that it goes from zero to 250 and you can score anywhere between. If you score near zero that would mean that you are completely unafraid and have no feelings about the experiment at all. You may guess, that because of the nature of the experiment, no one so far has scored that low. That doesn't mean that it is impossible to do so, but that it is unlikely.

O.K., now let me put the cuff on your wrist. [Experimenter returns to chair after securing the cuff.] Before I turn the meter on, I'd like to ask you to guess what your reaction might be. To help you make this guess, I will tell you that the average score is about 75 [150 in the High Threat condition]. [After subject makes his guess.] Now let's turn the meter on and see how close you are. Well, it looks like about 75 [25, in Low Fear group; 150 in High Fear group; 150 in High Threat group]. What does it look like to you? That is very close to the average [that is quite a bit different from the average]. [Subject is told to remove cuff.]

I see that this interview has taken a little less time than usual. Some people seem to have so many questions. You see, my assistant has been called out on an emergency and should be back in ten or fifteen minutes. I feel sure he will be back soon to work with you because he knew you were coming. Do you have time to wait? Actually, the rest of the experiment should only take about twenty minutes and you've only been in here twenty minutes and you did expect to stay an hour. Do you mind waiting? [After subject answers.] You actually can wait for Mr. Butler in one of two places. You can wait in the



experimental laboratory where you will be shocked later or you can wait in the room next to it which is something like a waiting room. Of course there is a place to sit in both rooms and there are some magazines in the waiting room.

[After subject makes his choice.] Before you go to the other room, would you fill out this questionnaire? This questionnaire has been designed to get at certain physiological measures which might influence your reaction to shock--such as how hungry or tired you are--or if you are not feeling well. There is also a question which is like a personality measure to get at your attitudes toward the experiment, for this might influence your reaction.

[After subject fills out Physical and Attitudinal Status sheet which appears in Appendix B.] Do you have any questions about the experiment before you go into the other room?





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